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IN RE: U.S. SERIAL NO. 10/021,174

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
Angst et al.

Serial No.: 10/021,174

Filing Date: October 29, 2001

For: KINETICALLY CONTROLLED SOLDER
BONDING

Attorney Docket No. ANGST 1-1-11-21-26
(13518-153)

Examiner: M. LEWIS

Art Unit: 2822

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

SIR:

In response to Office Action mailed April 23, 2003, please enter the following remarks into the file of the above-captioned application. A one-month Petition for Extension of Time is included herewith.

I. REMARKS

Claims 17-25 are currently pending in this application and stand rejected. No claim amendments are requested.

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II. THE REJECTIONS UNDER 35 U.S.C. § 103

Claims 17, 20-22, and 25 stand rejected under 35 U.S.C. § 103 over Published Japanese Patent Application 08-181392, to Kimura Yuji *et al.* ("Kimura"). Claims 18, 19, 23, and 24 stand rejected under 35 U.S.C. § 103 over Kimura in combination with U.S. Patent 5,990,560 (issued Nov. 23, 1999) to D.G. Coult *et al.* ("Coult").

A. APPLICANTS' INVENTION

Applicant discloses and claims an advantageous solder system comprising layers of metallic elements. Due to its carefully designed composition, the solder system of the invention begins melting at a first temperature (T1), then after a certain period of heating, the mixing of the elemental layers yields a composition that melts at a second, higher temperature (T2). The claimed solder system is extremely advantageous because it reduces or eliminates solder remelt during subsequent processing of the bonded part. This essential aspect of the solder system of the invention is reflected by the functional language in claim 17.

"wherein the solder formed by the chemical element layers has a usage temperature which is substantially higher than the first temperature of the binary solder"

The melting temperature of metal alloys is extremely sensitive to the alloy's composition. The point is that Applicants teach a very specific composition defined according to the functional claim language set forth above. Often, compositions are defined in terms of component percentages, however, functional language is a perfectly acceptable means to define a particular composition. See e.g., Manual of Patent Examining Procedure, § 2173.05(g) (8th ed 2001) (citing *In re Swinehart*, 439 F.2d 210 (C.C.P.A. 1971)).

B. REJECTIONS OVER KIMURA

Claims 17, 20-22, and 25 stand rejected under 35 U.S.C. § 103 over Kimura. Kimura, however, does teach or suggest Applicants' claimed solder. Kimura's solder composition is totally different. In complete contrast to Applicants' solder, Kimura's solder begins melting at a first temperature (T1), then after a certain period of heating, the mixing of the elemental layers yields a composition that melts at a second, lower temperature (T2). See e.g., Kimura English Language Translation (hereinafter, Kimura-Eng), Abstract ("[t]hereby bonding is enabled at a low melting point . . ."); Kimura-Eng, ¶ 0045 ("[f]rom this state diagram a (Au80wt%-Sn20wt%) nickel alloy becomes lower than the melting of an Au80wt%-Sn20wt% pellet . . .");

Kimura-Eng, ¶ 0045 ("[f]rom these results, the melting point of solder falls, a bonding strength is still stronger . . . "). Nowhere does Kimura teach or suggest Applicants' composition, which begins melting a lower T1 and, thereafter, solidifies at a higher temperature T2. In fact, as discussed above, Kimura teaches the exact opposite, that is, that it is advantageous that the resulting solder composition melt at a lower T2.

Accordingly, the prior art cited by the Examiner teaches away from Applicants' claimed invention. Prior art must be considered in its entirety, including disclosure that teaches away from the claims. See MPEP 2141.02.

A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by Applicant.

In re Gurley, 31 U.S.P.Q.2d 1130 (Fed. Cir.1994).

In sum, Kimura does not render any of Applicants' claims obvious because it does teach or suggest a composition wherein the solder formed by the chemical element layers has a usage temperature which is substantially higher than the first temperature of the binary solder. In fact, as discussed above, Kimura teaches the opposite. Accordingly, the Examiner is respectfully requested to withdraw the obviousness rejection over Kimura.

C. REJECTIONS OVER KIMURA IN VIEW OF COULT

Claims 18, 19, 23, and 24 stand rejected under 35 U.S.C. § 103 over Kimura in combination with Coult. Pursuant to 35 U.S.C. § 103(c), Coult is not available as prior art under 35 U.S.C. § 102(e)/103, thus, the rejection should be withdrawn. Applicants filed on October 25, 2001 and, therefore, are entitled to the provisions of 35 U.S.C. § 103(c) effective for applications filed on or after November 29, 1999. 35 U.S.C. § 103(c) provides that subject matter developed by another person that qualifies as prior art only under 35 U.S.C. § 102(e) is not available as prior art under § 103 where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Both Coult and the present application were under assignment obligation to the same party at the time the present invention was made. That is, the current application, U.S. Application No. 10/021,174, and U.S. Patent No. 5,990,560 (the "'560 Patent") were, at the time the invention of current Application No. 10/021,174 was made, owned by and/or subject to an

assignment obligation to Lucent Technologies, Inc ("Lucent"). The '560 Patent lists Lucent as the assignee. In an assignment recorded at Reel/Frame 9802/0803, the inventors of the current application (employees of Lucent) assigned all their rights in the invention to Lucent Technologies, Inc. Therefore, pursuant to 35 U.S.C. § 103(c), Coult is not prior art under 35 U.S.C. 102(c)/103 to the present application. The Examiner is respectfully referred to MPEP 706.02(I)(2)(II), Eighth Edition (Revised Feb. 2003). In sum, the obviousness rejection over the combination of Kimura and Coult should be withdrawn because Coult is not prior art for the purposes of 35 U.S.C. § 103(c).

III. CONCLUSION

In view of the above remarks, Applicants have overcome all objections and rejections, and reconsideration is requested. A one-month Petition for Extension of Time is included herewith.

Respectfully submitted,

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August 15, 2003

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